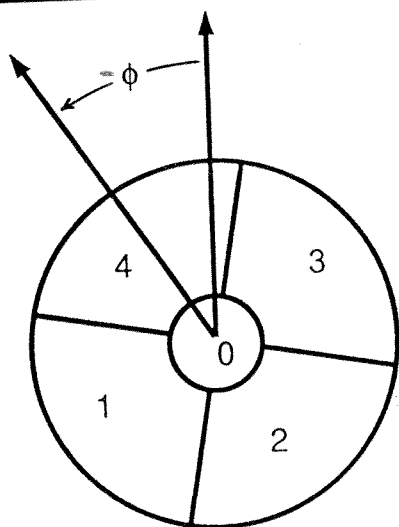
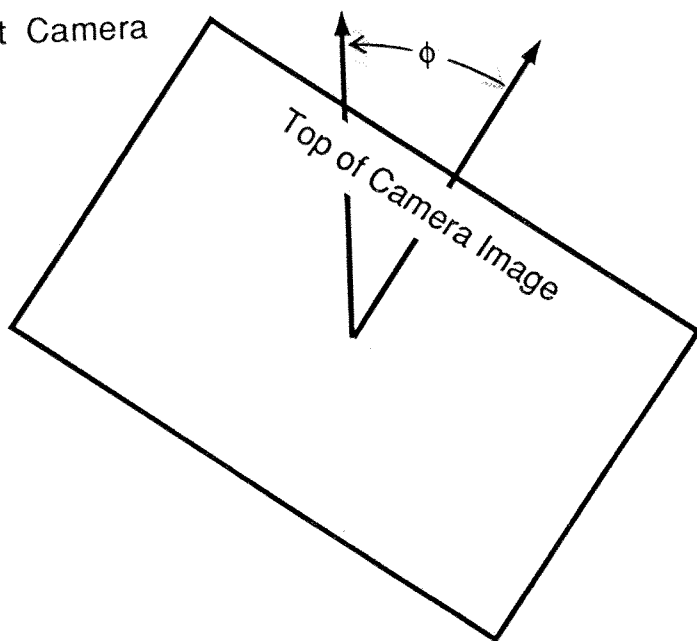


To: BBXRT Data Analysts  
From: R. Kelley  
Date: 22 February 1991  
Subject: Pixel Orientation - Revisited (with revised Figure)

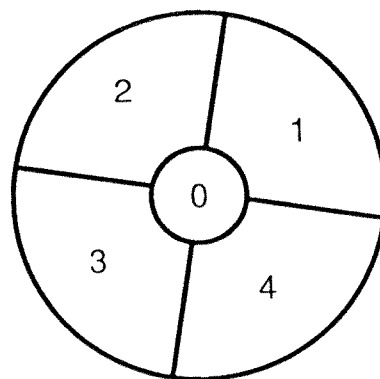
In a previous memo, I gave the orientation of the BBXRT X-ray pixels and camera in terms of Shuttle coordinates. One of the statements in that memo was misleading in that it gave the orientation of the pixels that would be observed if you were looking from behind the detectors out towards the sky. This does not mean that this is how the detectors project onto the sky, since the X-rays have to go through a mirrors that invert images. The actual orientation on the *celestial sphere* is shown in the attached figure. The angle  $\phi$  is the rotation angle given in the aspect solutions. When  $\phi$  is zero, pixels A4 and B2 are in the direction of increasing declination. To get the proper orientation, you put the detector on the center of the aspect solution and rotate the detectors counter-clockwise by an angle  $\phi$ .

↑  
DEC

Aspect Camera



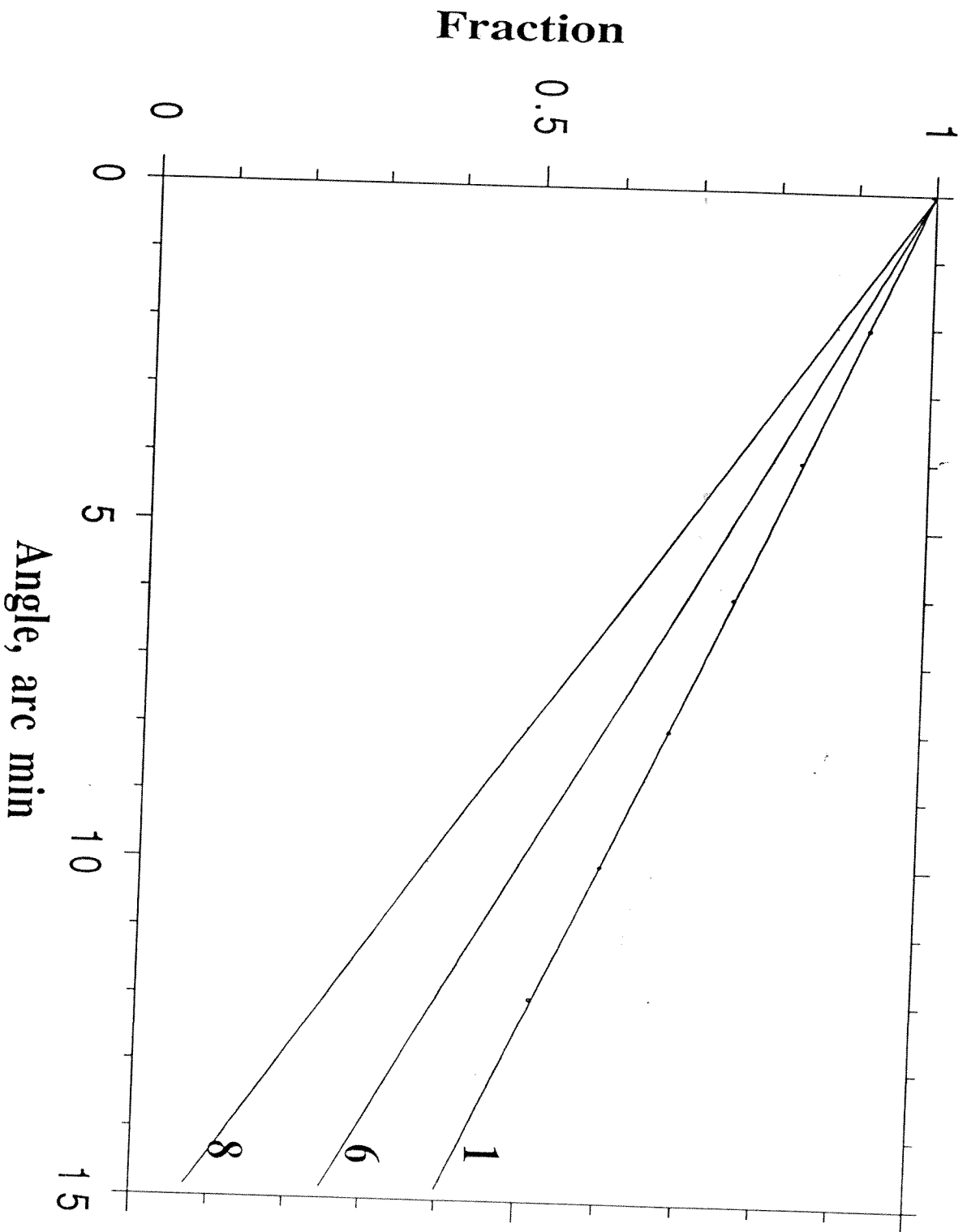
Detector A



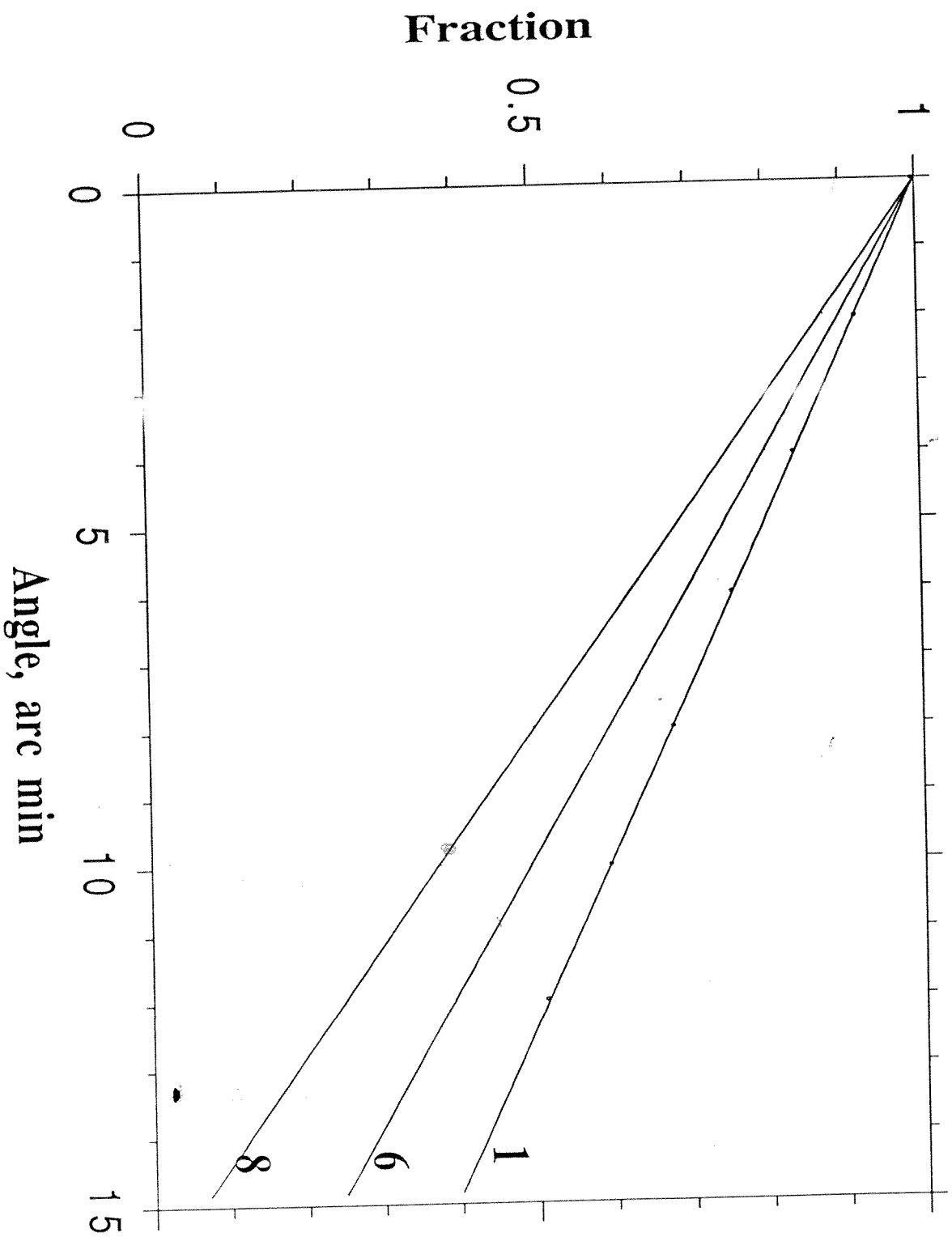
Detector B

← R.A.

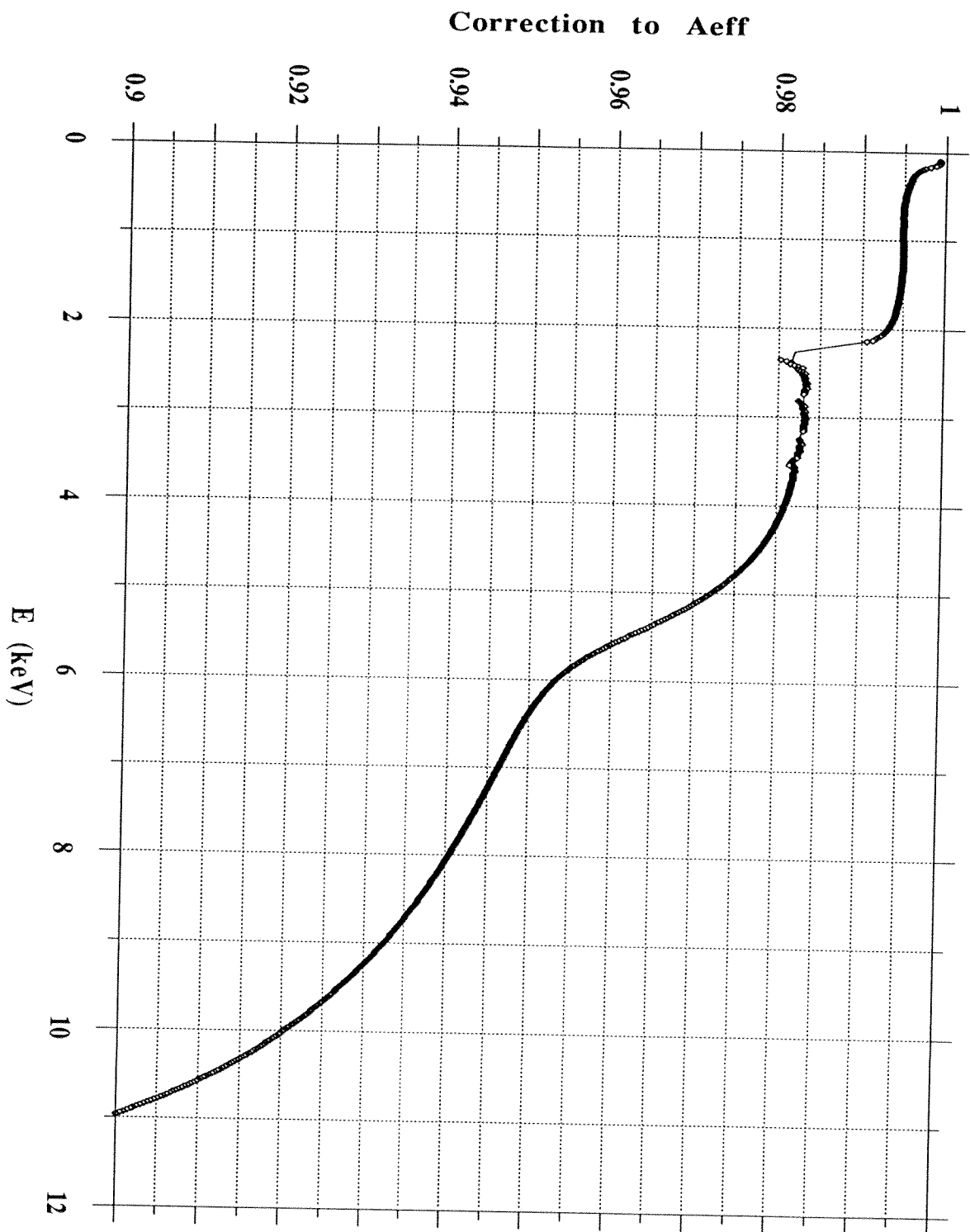
**BXRT Off-Axis Response for 1, 6 and 8 keV.**



# BBXRT Off-Axis Response for 1, 6 and 8 keV.



—○— Au dens = .84      Corrections to BBXRT effective area as a fctn  
of the Au density normalized to 0.87





From: LHEAVX::SWANK 5-OCT-1991 10:49:10.99  
To: LHEAVX::WEAVER  
CC:  
Subj: RE: sun4new xspec version

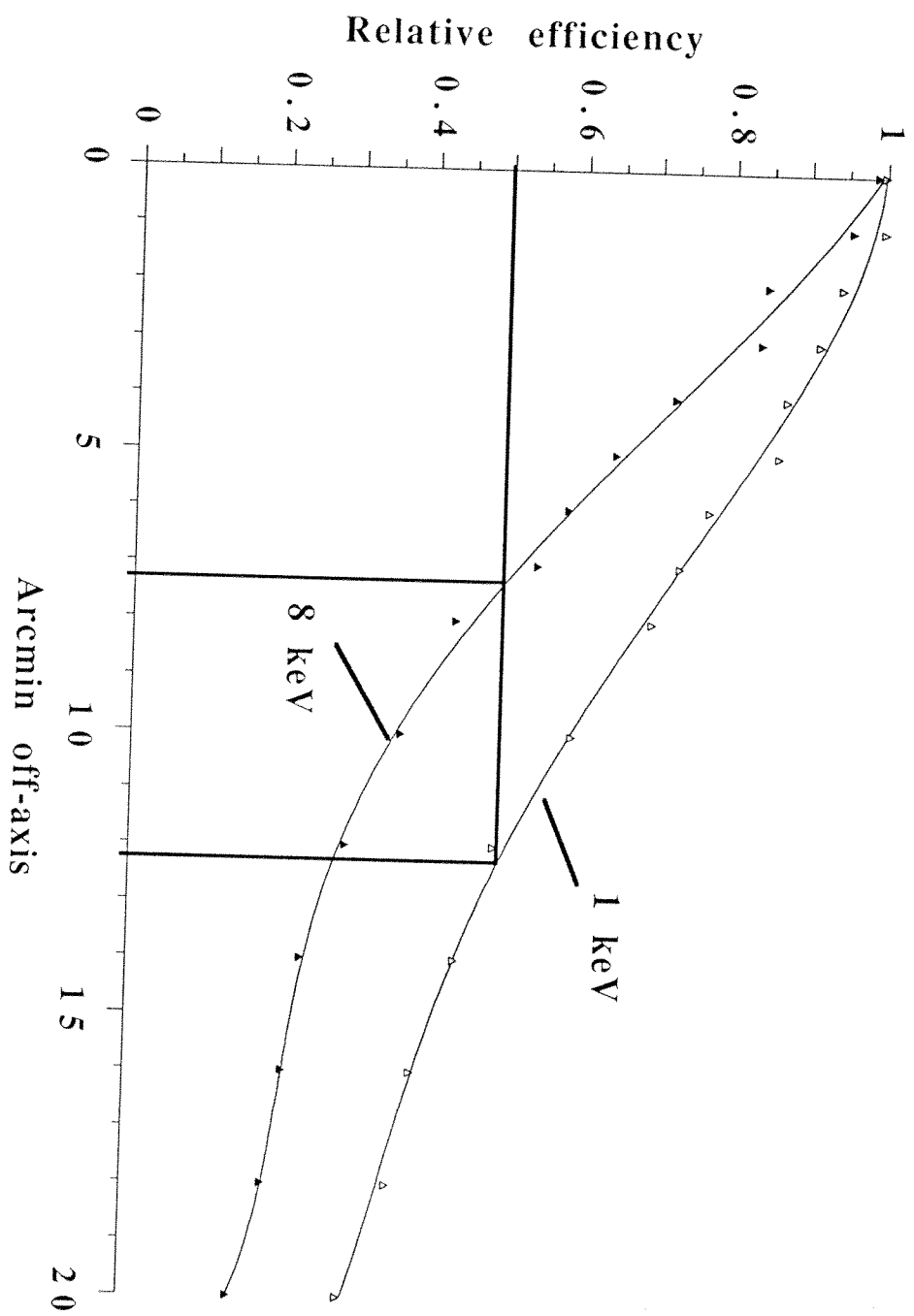
Kim,  
I talked to Pete Thurs. (I think it was, and thought he might have then taken it up with you, but I guess everybody was busy.) He remembered when I asked him, that he had "tweaked" the area at the gold edge to match the data when Keith had shown him it was wrong. I am a little uncomfortable about it and trust it is so big an effect and so different from the calibration line indicators, that it is not a question of gain being VERY off. I am not sure of the best way to "tweak" it. He isn't in yet and unless my unsociability wins, I won't be here this afternoon either.

Damian and I had to tweak the Ni edge for the Einstein mirror for the SSS response. But the Bragg crystal experiment saw the same effect, so we felt vindicated. However the direction was the opposite, the edge dropped at lower energy instead of higher! - Jean





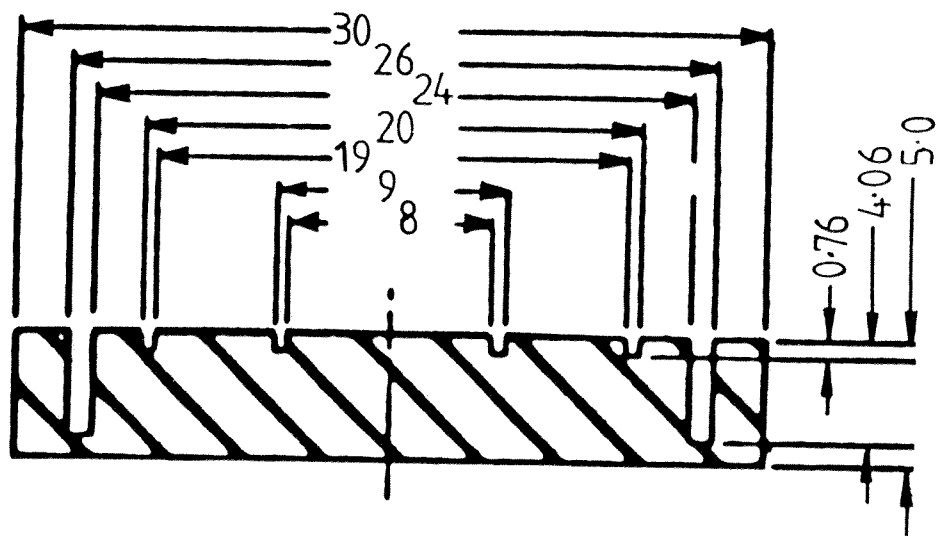
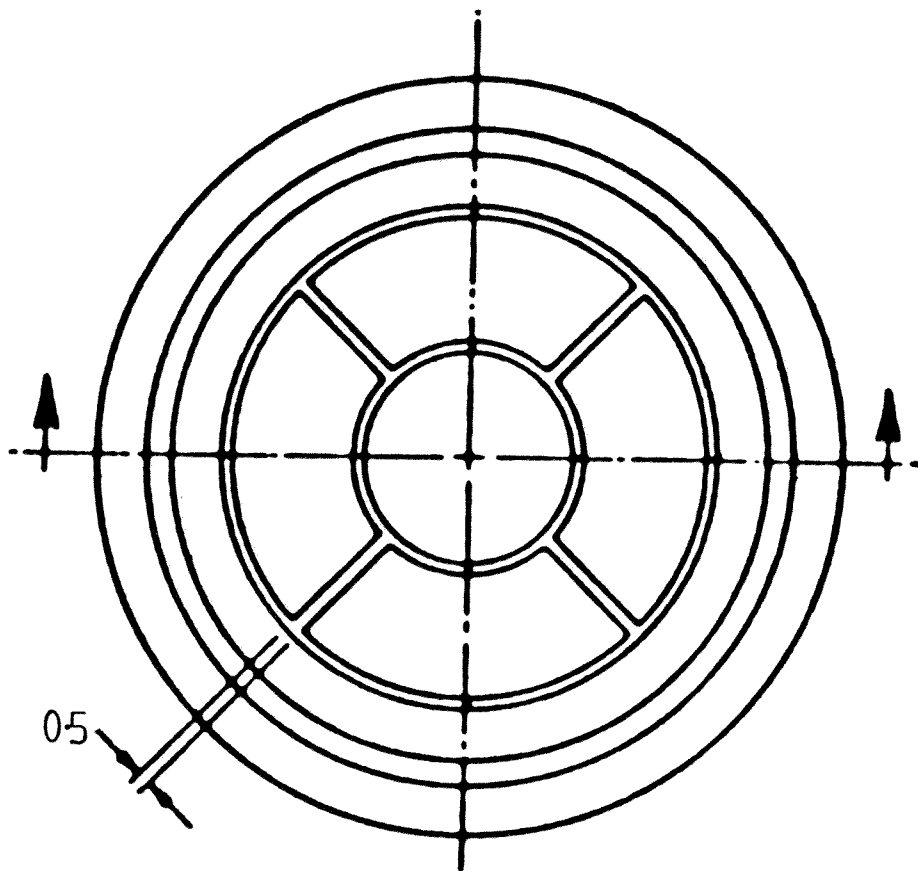
# BXRT Mirror Off-axis Response



XXXXXXXXXXXXXXXXXXXX



XXXXXXXXXXXXXXXXXXXX





**Table x: Fractional Power in pixels as function of angle and azimuth**

Off-axis angle	Azimuth	PIX 0	PIX 1	PIX 2	PIX 3	PIX 4	Observed Fraction
0.00	0.00	0.762	0.057	0.060	0.061	0.060	0.692
1.00	0.00	0.706	0.104	0.043	0.042	0.105	0.636
2.00	0.00	0.380	0.269	0.046	0.046	0.259	0.412
3.00	0.00	0.138	0.396	0.032	0.032	0.402	0.407
4.00	0.00	0.048	0.449	0.020	0.023	0.461	0.441
5.00	0.00	0.021	0.476	0.014	0.013	0.476	0.451
6.00	0.00	0.015	0.482	0.010	0.009	0.484	0.441
7.00	0.00	0.010	0.481	0.007	0.007	0.496	0.394
8.00	0.00	0.008	0.502	0.005	0.006	0.479	0.302
9.00	0.00	0.007	0.490	0.005	0.006	0.491	0.177
0.00	22.50	0.766	0.058	0.060	0.059	0.057	0.689
1.00	22.50	0.712	0.117	0.048	0.040	0.083	0.634
2.00	22.50	0.373	0.390	0.060	0.042	0.135	0.421
3.00	22.50	0.094	0.749	0.031	0.020	0.106	0.569
4.00	22.50	0.029	0.866	0.019	0.010	0.076	0.735
5.00	22.50	0.013	0.910	0.013	0.006	0.059	0.790
6.00	22.50	0.007	0.938	0.008	0.004	0.043	0.804
7.00	22.50	0.005	0.950	0.006	0.003	0.036	0.762
8.00	22.50	0.004	0.957	0.006	0.002	0.031	0.623
9.00	22.50	0.008	0.929	0.008	0.003	0.052	0.279
0.00	45.00	0.757	0.062	0.061	0.059	0.062	0.688
1.00	45.00	0.705	0.131	0.066	0.036	0.063	0.635
2.00	45.00	0.370	0.435	0.079	0.035	0.082	0.438
3.00	45.00	0.087	0.799	0.051	0.016	0.047	0.615
4.00	45.00	0.024	0.905	0.032	0.009	0.031	0.795
5.00	45.00	0.012	0.939	0.023	0.005	0.022	0.849
6.00	45.00	0.008	0.956	0.017	0.003	0.017	0.848
7.00	45.00	0.004	0.968	0.013	0.002	0.013	0.791
8.00	45.00	0.003	0.970	0.012	0.002	0.013	0.647
9.00	45.00	0.006	0.951	0.019	0.001	0.022	0.290

Notes:

Component 1:  $\sigma = 1.80$ , power = 0.670 ; Component 2:  $\sigma = 5.80$ , power = 0.330.



18 JUNE 91

BRIGHT EARTH  
SUSPECTED BY KIM WEAVER

NAME	NO.	DAYS
BRIGHT EARTH SLEW	(64)	4.0005-4.03435
UNDEFIND	(87)	1.03175-1.0473
SLEW	(88)	1.05000-1.0587
UNDEFIND	(351)	3.01638-3.01870
SLEW	(352)	3.0188-3.02203
UNDEFIND	(353)	3.02213-3.03055
SLEW	(354)	3.03064-3.03203
UNDEFIND	(355)	3.03213-3.03574
SLEW	(356)	3.03583-3.03685
UNDEFIND	(357)	3.03694-3.04018
SLEW	(508)	4.50213-4.50240
UNDEFIND	(509)	4.50250-4.50463
DEFIND	(510)	4.50472-4.50935
DEFIND	(511)	4.51379-4.51574
AB	(512)	4.51583-4.52250
SLEW	(513)	4.53341-4.54055

FILE
BQM021473SS
BQM1004543P
BQM10100458Q M1010849S
BQM3002335P
BQM3002431S
BQM3003151P
BQM3004407S
BQM3004615P
BQM3005135S
BQM3005311P
BQL4120303S
BQL4120335P
BQL4120647P
BQL4121951P
BQL4122244P
BQM4124823S

NAME	NO.	DAYS	FILE
SLEW	(514)	4.54064-4.54351	BQM4125831
CYGX-2	(515)	4.54361-4.55129	BQM4130247
UNDEFIND	(532)	4.77231-4.79750	BQM4182807F
BRIGHT EARTH	(533)	4.79759-4.80314	BQM4190831
UNDEFIND	(534)	4.80333-4.80444	BQM4191647P
BRIGHT EARTH	(535)	4.82453-4.83870	BQM4194719S
UNDEFIND	(536)	4.83879-4.83907	BQM4200751P
UNDEFIND	(537)	4.83916-4.84388	BQM4200823P
SLEW	(538)	4.84398-4.84759	BQM4201519S

FROM  
BRIGHT  
STEP CHARTS





From: LHEAVX::WEAVER 7-MAY-1991 14:33:51.22  
To: @[KSMAL]XRAY.DIS  
CC:  
Subj: BBXRT data analysis note #6

Off-axis Response matrices  
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As promised, a first guess at off-axis responses is now available. The program to generate these (called bbxrtrsp) is located on the suns. To run it type bbxrtrsp from your directory. It will prompt you for the detector, an output file prefix, and the off-axis angle (in arcminutes).

You can now (with reasonable certainty):

- Analyze a0 data for sources located off-axis.
- Begin to analyze outer pixel data for on and off-axis sources.

The program is not yet set up to deal with the following:

- 1) Extended sources.
- 2) Corrections for gold layer on B detector.
- 3) Adding multiple pixels together (i.e. averaging the responses.)
- 4) I have not tried to correct the problems around the Gold edge, and it is highly probable that this effect may become worse off-axis.

Proceed with Caution:  
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It is important to remember that adding multiple pixels together may create problems at this stage. I have not yet investigated whether there are differences between the outer pixels. Presently, I am most suspicious of A3. It gives a steep slope for the crab and predicts the wrong off-axis angle for cyg x-2.

Also, there is still a 5-8% 'bump' in the Crab residuals between 5-8 keV in some of the outer pixels.

A Final Note:  
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I would greatly appreciate it if anyone who has both on and off-axis data could quickly look at all of their data with the appropriate responses and let me know what the discrepancies are between a0 and outer pixel fits. It is important that I have as much information as possible on any problems since we are so limited on off-axis calibration targets.

Thanks,

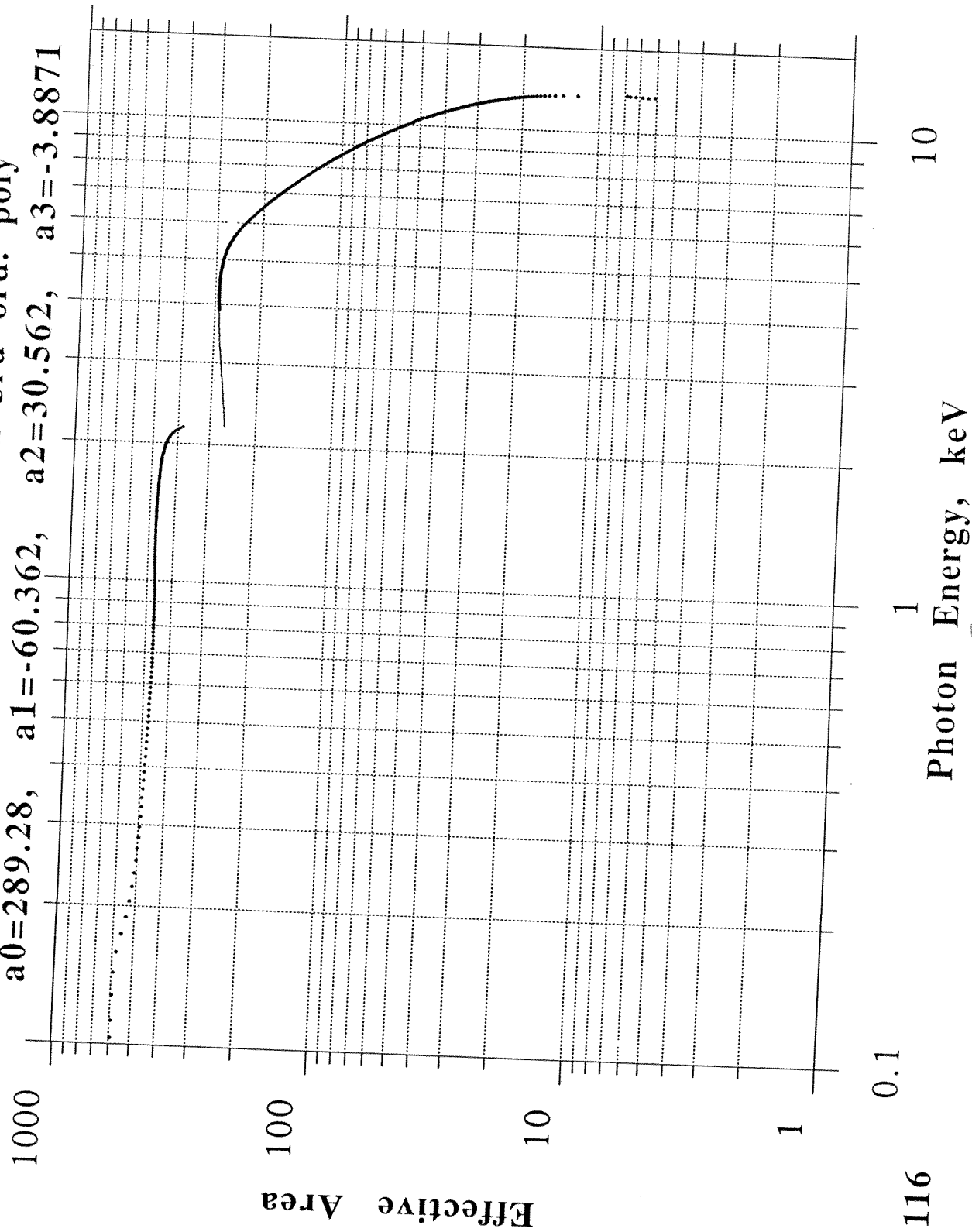
-Kim.



BTEL800 (a0) as off 3/12/92

Red segment fitted with 3rd ord. poly

$a0=289.28$ ,  $a1=-60.362$ ,  $a2=30.562$ ,  $a3=-3.8871$



Plot 116

Photon Energy, keV

10

0.1



